

SEQUENCE LISTING

<110> The Curators of the University of Missouri

<120> PHAGE DISPLAY SELECTION OF ANTI FUNGAL PEPTIDES

<130> UMO 1521.1

<150> US 60/195,785

<151> 2000-04-10

<160> 48

<170> PatentIn version 3.0

<210> 1

<211> 33

<212> PRT

<213> Type 88 filamentous bacteriophage

<220>

<221> VARIANT

<222> (9)..(23)

<223> x=any amino acid encoded by the codon NNK

<400> 1

Leu Val Pro Met Leu Ser Phe Ala Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa  
1 5 10 15

Xaa Xaa Xaa Xaa Xaa Xaa Pro Ala Glu Gly Asp Asp Pro Ala Lys  
20 25 30

Ala

<210> 2

<211> 20

<212> DNA

<213> Artificial

<220>

<221> misc\_feature

<222> (1)..(20)

<223> Primer

<400> 2

ggagccttta attgtatcg

20

<210> 3

<211> 19

<212> DNA

<213> Artificial

<220>  
<221> misc\_feature  
<222> (1)..(19)  
<223> Primer

<400> 3  
agttagcagaa gcctgaaga

19

<210> 4  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 4  
Ala Ala Pro Asp Leu Gln Asp Ala Met  
1 5

<210> 5  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 5  
Ala Asp Arg Leu Asn Ser Asp Ala Gly  
1 5

<210> 6  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 6  
Ala Asp Arg Pro Ser Thr Thr Ser Leu  
1 5

<210> 7  
<211> 9  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 7

Ala Asp Pro Pro Arg Thr Val Ser Thr  
1 5

<210> 8  
<211> 9  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 8

Ala Asp Arg Pro Ser Met Ser Pro Thr  
1 5

<210> 9  
<211> 9  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)..(9)  
<223> Random peptide insert

<400> 9

Ala Asp Arg Thr Ser Asn Ala Ser Thr  
1 5

<210> 10  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(9)

<223> Random peptide insert

<400> 10

Ala Asp Lys Ser Tyr Ile Pro Ser Ser  
1 5

<210> 11

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(9)

<223> Random peptide insert

<400> 11

Ala Val Arg Asn Pro Ser His His Ser  
1 5

<210> 12

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(9)

<223> Random peptide insert

<400> 12

Ala Asp Pro Thr Pro Arg Gly His Ser  
1 5

<210> 13

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(9)

<223> Random peptide insert

<400> 13

Ala Asp Pro Thr Arg Gln Pro His Ser  
1 5

<210> 14

<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(9)  
<223> Random peptide insert

<400> 14

Ala Glu His Gln Asn Ser Ala Gly Pro  
1 5

<210> 15  
<211> 10  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(10)  
<223> Random peptide insert

<400> 15

Ala Asp Ala Arg Ser Ala Gly Ala Ile Ser  
1 5 10

<210> 16  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(9)  
<223> Random peptide insert

<400> 16

Ala Asp Ser Lys Asn Ala Gly Pro Met  
1 5

<210> 17  
<211> 9  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(9)  
<223> Random peptide insert

<400> 17

Ala Glu Thr Lys Phe Ser Gly Ser Ala  
1 5

<210> 18

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(9)

<223> Random peptide insert

<400> 18

Ala Asp Pro Lys Gly Ser Gly Val Thr  
1 5

<210> 19

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(9)

<223> Random peptide insert

<400> 19

Ala Gly Leu Thr Ser Pro Asn Asp Met  
1 5

<210> 20

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(9)

<223> Random peptide insert

<400> 20

Ala Asp Ile Thr Asp Pro Met Gly Ala  
1 5

<210> 21

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(9)

<223> Random peptide insert

<400> 21

Ala Val Gly Thr His Thr Pro Asp Ser  
1 5

<210> 22

<211> 9

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(9)

<223> Random peptide insert

<400> 22

Ala Val Ser Pro Asn Val His Asp Gly  
1 5

<210> 23

<211> 15

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(15)

<223> Random peptide insert

<400> 23

Val Ala Ala Phe Ser Leu Val Trp Ala Thr His Leu Met Leu Ser  
1 5 10 15

<210> 24

<211> 15

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)..(15)

<223> Random peptide insert

<400> 24

Leu Thr Arg Cys Leu Val Ser Thr Glu Met Ala Ala Arg Arg Pro  
1 5 10 15

<210> 25  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<400> 25

Ser Ala Pro Tyr Leu Pro Tyr Phe Asp Leu Leu His Phe Pro Ile  
1 5 10 15

<210> 26  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (14)..(14)  
<223> x=unknown amino acid

<400> 26

Pro Ser Ser Tyr Glu Ala Ser Arg Arg Pro Glu His Trp Xaa Phe  
1 5 10 15

<210> 27  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<400> 27

Ser Ala Thr Asp Thr Thr Leu Pro Met Met Thr Ala Ile Arg Ser  
1 5 10 15

<210> 28  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (9)...(9)  
<223> x=unknown amino acid

<400> 28

Thr Arg Leu Ser Pro Met Glu Ser Xaa Ala Met Leu Leu Ala Pro  
1 5 10 15

<210> 29  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 29

Leu Leu Pro Val Ser Pro Pro Phe Ala Pro Asn Ala Ser Ser Thr  
1 5 10 15

<210> 30  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 30

Met Ser Asn Phe Pro Thr Ser His Ala Pro Cys Pro Val Glu Ile  
1 5 10 15

<210> 31  
<211> 15

<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<400> 31

Glu Phe Arg Lys Asn Tyr Pro Ser Ala Ala Pro Leu Ile Pro Arg  
1 5 10 15

<210> 32  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (2)..(2)  
<223> x=unknown amino acid

<400> 32

Pro Xaa Val His Gly Ser Ile Pro Leu Thr Pro Pro Leu Gly Phe  
1 5 10 15

<210> 33  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (3)..(3)  
<223> x=unknown amino acid

<400> 33

Leu Phe Xaa Cys Tyr Pro Pro Cys Thr Tyr Ser Tyr Cys Leu Ser  
1 5 10 15

<210> 34  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (14)...(14)  
<223> x=unknown amino acid

<400> 34

Met Ser Asn Phe Pro Thr Ser His Ala Pro Cys Pro Val Xaa Ile  
1 5 10 15

<210> 35  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 35

Pro Glu Trp Lys Ser Ser Trp Ser Pro Cys Thr Pro Arg Cys Pro  
1 5 10 15

<210> 36  
<211> 15  
<212> PRT  
<213> Artificial  
  
<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (11)...(11)  
<223> x=unknown amino acid

<400> 36

Ala Met Ser Arg Trp Leu Arg Pro Arg Glu Xaa Asn Ala Pro Pro  
1 5 10 15

<210> 37  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<220>  
<221> VARIANT  
<222> (6)..(6)  
<223> x=unknown amino acid

<220>  
<221> VARIANT  
<222> (10)..(10)  
<223> x=unknown amino acid

<400> 37

Thr His Thr Thr Phe Xaa Val Thr Val Xaa Leu His Glu Pro Pro  
1 5 10 15

<210> 38  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<400> 38

Met Thr Ser Pro Arg Asn Ser Gln Leu Ile Val Pro Phe Cys Leu  
1 5 10 15

<210> 39  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)..(15)  
<223> Random peptide insert

<400> 39

Pro Thr Leu Gly Arg Phe Asn Arg Pro Ser Cys Ser Ile Ile Val  
1 5 10 15

<210> 40

<211> 15

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(15)

<223> Random peptide insert

<400> 40

Ala Pro Gln Cys His Pro His Leu Pro Phe Asp Met Ile His Val  
1 5 10 15

<210> 41

<211> 15

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(15)

<223> Random peptide insert

<220>

<221> VARIANT

<222> (12)...(12)

<223> x=unknown amino acid

<400> 41

Asn His Asn Ser Leu Pro Ala Gln Tyr Leu Val Xaa Ile Leu Arg  
1 5 10 15

<210> 42

<211> 15

<212> PRT

<213> Artificial

<220>

<221> DOMAIN

<222> (1)...(15)

<223> Random peptide insert

<400> 42

Asp Gln Pro Cys Thr Pro Ser Pro Asp Val Ser Phe Tyr Arg Ser  
1 5 10 15

<210> 43  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 43

Val Ala Ala Pro Ser His Trp Leu Lys Pro Ser Leu Asp Cys Phe  
1 5 10 15

<210> 44  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 44

Asn Pro Leu Tyr Lys Asn Pro Pro Pro Arg Val Ala Met Cys Leu  
1 5 10 15

<210> 45  
<211> 15  
<212> PRT  
<213> Artificial

<220>  
<221> DOMAIN  
<222> (1)...(15)  
<223> Random peptide insert

<400> 45

Leu Ile Phe Arg Tyr Ala Pro Pro Pro Leu Phe Leu Arg Pro Pro  
1 5 10 15

<210> 46  
<211> 36  
<212> DNA  
<213> Artificial

<220>  
<221> misc\_feature  
<222> (1)..(36)  
<223> + strand of DNA encoding random peptide Pc 87

<400> 46  
agcttagcaga tagaccatca atgtcaccaa catagt

36

<210> 47  
<211> 36  
<212> DNA  
<213> Artificial

<220>  
<221> misc\_feature  
<222> (1)..(36)  
<223> - strand of DNA encoding peptide Pc 87

<400> 47  
ctagactatg ttgggtgacat tgatggtcta tctgct

36

<210> 48  
<211> 611  
<212> PRT  
<213> Artificial

<220>  
<221> SIGNAL  
<222> (1)..(85)  
<223> Mat-alpha secretory sequence

<220>  
<221> DOMAIN  
<222> (86)..(600)  
<223> Cytokinin oxidase 1

<220>  
<221> DOMAIN  
<222> (601)..(602)  
<223> Linker

<220>  
<221> DOMAIN  
<222> (603)..(611)  
<223> Random peptide Pc 87

<400> 48

Met Arg Phe Pro Ser Ile Phe Thr Ala Val Leu Phe Ala Ala Ser Ser

1

5

10

15

Ala Leu Ala Ala Pro Val Asn Thr Thr Glu Asp Glu Thr Ala Gln  
20 25 30

Ile Pro Ala Asp Ala Val Ile Gly Tyr Ser Asp Leu Glu Gly Asp Phe  
35 40 45

Asp Val Ala Val Leu Pro Phe Ser Asn Ser Thr Asn Asn Gly Leu Leu  
50 55 60

Phe Ile Asn Thr Thr Ile Ala Ser Ile Ala Ala Lys Glu Glu Gly Val  
65 70 75 80

Ser Leu Glu Lys Arg Leu Ala Ala Gly Thr Pro Ala Leu Gly Asp Asp  
85 90 95

Arg Gly Arg Pro Trp Pro Ala Ser Leu Ala Ala Leu Ala Leu Asp Gly  
100 105 110

Lys Leu Arg Thr Asp Ser Asn Ala Thr Ala Ala Ala Ser Thr Asp Phe  
115 120 125

Gly Asn Ile Thr Ser Ala Leu Pro Ala Ala Val Leu Tyr Pro Ser Thr  
130 135 140

Gly Asp Leu Val Ala Leu Leu Ser Ala Ala Asn Ser Thr Pro Gly Trp  
145 150 155 160

Pro Tyr Thr Ile Ala Phe Arg Gly Arg Gly His Ser Leu Met Gly Gln  
165 170 175

Ala Phe Ala Pro Gly Gly Val Val Val Asn Met Ala Ser Leu Gly Asp  
180 185 190

Ala Ala Ala Pro Pro Arg Ile Asn Val Ser Ala Asp Gly Arg Tyr Val  
195 200 205

Asp Ala Gly Gly Glu Gln Val Trp Ile Asp Val Leu Arg Ala Ser Leu  
210 215 220

Ala Arg Gly Val Ala Pro Arg Ser Trp Asn Asp Tyr Leu Tyr Leu Thr  
225 230 235 240

Val Gly Gly Thr Leu Ser Asn Ala Gly Ile Ser Gly Gln Ala Phe Arg  
245 250 255

His Gly Pro Gln Ile Ser Asn Val Leu Glu Met Asp Val Ile Thr Gly  
260 265 270

His Gly Glu Met Val Thr Cys Ser Lys Gln Leu Asn Ala Asp Leu Phe  
275 280 285

Asp Ala Val Leu Gly Gly Leu Gly Gln Phe Gly Val Ile Thr Arg Ala  
290 295 300

Arg Ile Ala Val Glu Pro Ala Pro Ala Arg Ala Arg Trp Val Arg Phe

305 310 315 320

Val Tyr Thr Asp Phe Ala Ala Phe Ser Ala Asp Gln Glu Arg Leu Thr  
325 330 335

Ala Pro Arg Pro Gly Gly Gly Ala Ser Phe Gly Pro Met Ser Tyr  
340 345 350

Val Glu Gly Ser Val Phe Val Asn Gln Ser Leu Ala Thr Asp Leu Ala  
355 360 365

Asn Thr Gly Phe Phe Thr Asp Ala Asp Val Ala Arg Ile Val Ala Leu  
370 375 380

Ala Gly Glu Arg Asn Ala Thr Thr Val Tyr Ser Ile Glu Ala Thr Leu  
385 390 395 400

Asn Tyr Asp Asn Ala Thr Ala Ala Ala Ala Val Asp Gln Glu Leu  
405 410 415

Ala Ser Val Leu Gly Thr Leu Ser Tyr Val Glu Gly Phe Ala Phe Gln  
420 425 430

Arg Asp Val Ala Tyr Ala Ala Phe Leu Asp Arg Val His Gly Glu Glu  
435 440 445

Val Ala Leu Asn Lys Leu Gly Leu Trp Arg Val Pro His Pro Trp Leu  
450 455 460

Asn Met Phe Val Pro Arg Ser Arg Ile Ala Asp Phe Asp Arg Gly Val  
465 470 475 480

Phe Lys Gly Ile Leu Gln Gly Thr Asp Ile Val Gly Pro Leu Ile Val  
485 490 495

Tyr Pro Leu Asn Lys Ser Met Trp Asp Asp Gly Met Ser Ala Ala Thr  
500 505 510

Pro Ser Glu Asp Val Phe Tyr Ala Val Ser Leu Leu Phe Ser Ser Val  
515 520 525

Ala Pro Asn Asp Leu Ala Arg Leu Gln Glu Gln Asn Arg Arg Ile Leu  
530 535 540

Arg Phe Cys Asp Leu Ala Gly Ile Gln Tyr Lys Thr Tyr Leu Ala Arg  
545 550 555 560

His Thr Asp Arg Ser Asp Trp Val Arg His Phe Gly Ala Ala Lys Trp  
565 570 575

Asn Arg Phe Val Glu Met Lys Asn Lys Tyr Asp Pro Lys Arg Leu Leu  
580 585 590

Ser Pro Gly Gln Asp Ile Phe Asn Lys Leu Ala Asp Arg Pro Ser Met  
595 600 605

Ser Pro Thr

610